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IS 12499 (1988): Two stage, 0.5 litre diesel fuel filters
[TED 2: Automotive Primemovers]

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IS : 12499-1988

(Reaffirmed 1999)

Indian Standard

SPECIFICATION FOR TWO STAGE, 0·5 LITRE DIESEL FUEL FILTERS

Automotive Prime Movers Sectional Committee, EDC 102; Automotive Filters Subcommittee,EDC 102:5 [Ref : Doc : EDC 102/14(3750)]

1. Scope — Specifies the overall and mounting dimensions and the performance requirements of two stage, diesel fuel filters of 0·5 litre casing capacity (pre-filter as well as fine filter bowls) and their filter inserts.

2. Material — For casing and filter inserts the material shall be suitable for the purpose intended. The properties shall be stated by the manufacturer.

3. Dimensions — The overall dimensions shall be as given in Fig. 1. The dimensions for filter inserts shall be as shown in Fig. 2.

4. Designation — The designation of the two stage fuel filter shall include the following characteristics:

a) Capacity in litres (capacity of single casing);

b) Direction of flow, that is, whether the fuel flows towards right (R) or left (L); and

c) Number of this Indian Standard.

Example :

A two stage, fuel filter having 0·5 litre casing capacity with pre-filter and fine filter inserts, but without connecting parts with the direction of flow towards left (as shown in Fig. 1) shall be designated as:

Two Stage, 0·5 litre filter, L, IS : 12499

5. Performance Requirements — The performance requirements of the filters shall be as follows when tested in accordance with IS : 3351-1968 'Methods of test for diesel engine fuel filters'.

5.1 *Mechanical Tightness Test* — The filters shall be mechanically tight. The filter housing shall withstand an air pressure of 2·5 bar without any leakage for 20 seconds.

5.2 *Through Flow Rate Test* — The through flow quantity when determined according to IS : 3351-1968 shall not be less than that specified for the particular application.

5.3 *Pressure Drop Test* — The pressure drop across the filter when tested according to IS : 3351-1968 shall be not more than 850 mm water head at the rated flow.

5.4 Filtering efficiency with test dust specified in IS : 3351-1968 shall be as given below:

a) *For pre-filter inserts* — Minimum 50 percent after 5 minutes of start of test and gradually increasing to minimum 65 percent after 30 minutes of start of test.

b) *For fine filter inserts* — Minimum 65 percent after 5 minutes of start of test and gradually increasing to minimum 95 percent after 30 minutes of start of test.

Note — If the filtering efficiency test is continued after 30 minutes of start of test, there shall be no tendency of reduction of filtering efficiency.

5.5 *Clogging Test* — The through flow of the filter after 30 minutes of start of filtering efficiency test shall be at least 65 percent of the initial flow.

6. Marking

6.1 Two stage fuel filters shall be marked with the following:

a) Capacity;

b) Symbol 'R' or 'L' for right hand or left hand direction of flow;

c) An 'arrow' in the direction of flow;

d) Words 'PRE' and 'FINE' on the bowls (or casings), containing pre-filter and fine filter inserts respectively; and

e) Manufacturer's name or trade-mark.

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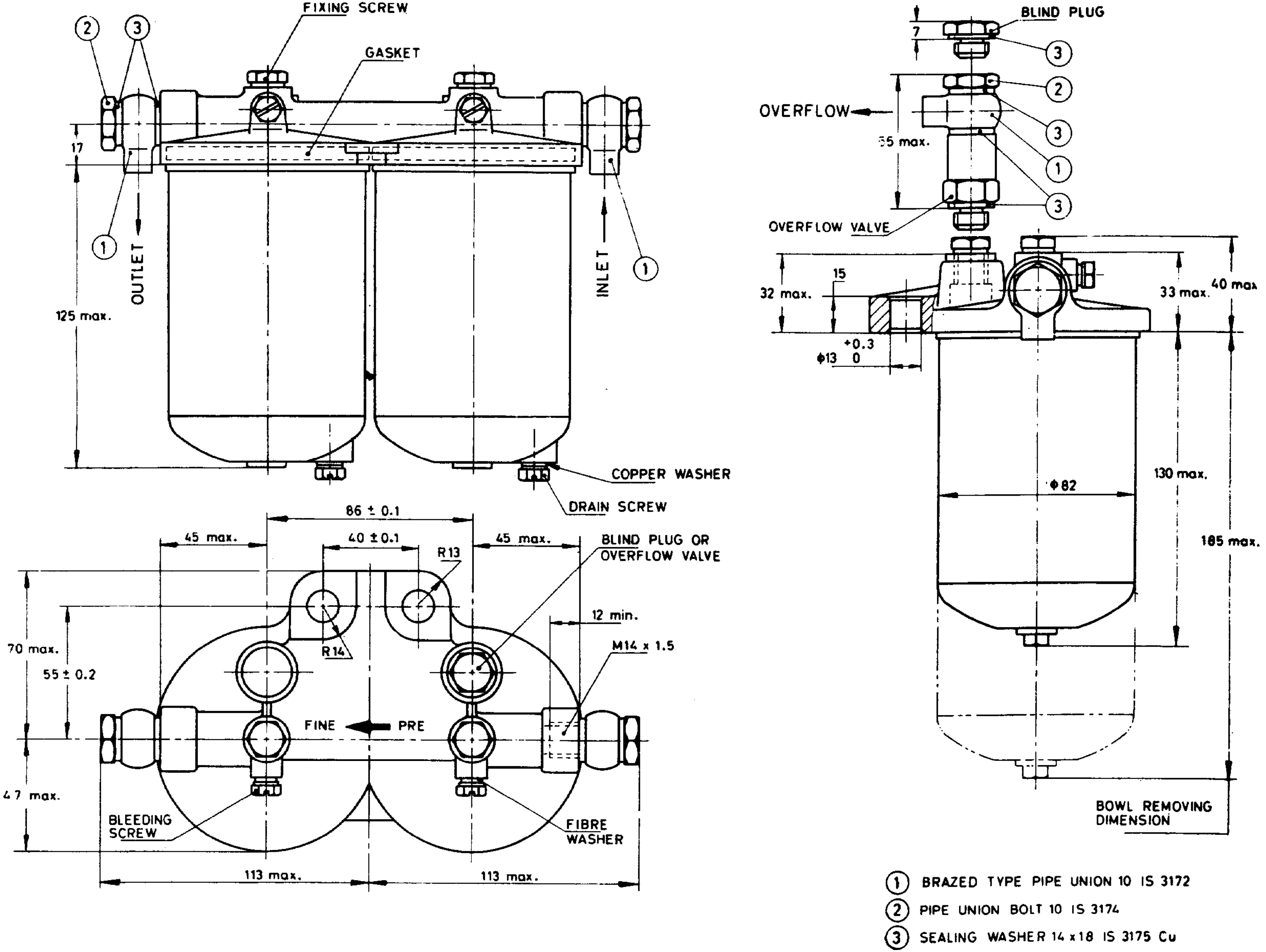


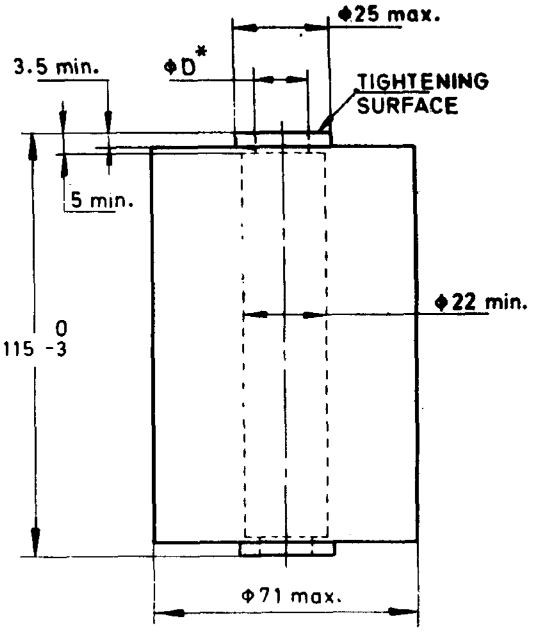
All dimensions in millimetres.

FIG. 1 DIMENSIONS FOR TWO STAGE, 0·5 LITRE DIESEL FUEL FILTERS

6.2 *Standard Marking* — Details available with the Bureau of Indian Standards.

7. Sampling and Criteria for Conformity — Unless otherwise agreed to between the purchaser and the manufacturer, the sampling scheme and criteria for conformity shall be as given in Appendix A.

8. Packing — Two stage, 0·5 litre diesel fuel filters shall be coated with anti-corrosive compound, wrapped in a paper/polythene bag and packed in a cardboard carton. The carton shall be such that no damage is caused to the filter during transit.



*Dimensions ϕD should be tight for bolt $\phi 14$ h 11

All dimensions in millimetres.

FIG. 2 DIMENSION FOR 0·5 LITRE FILTER INSERT

APPENDIX A

(*Clause* 7)

SAMPLING OF TWO STAGE, 0.5 LITRE FUEL FILTERS FOR DIESEL ENGINES

A-1. Process Inspection

A-1.1 The object of inspecting fuel filters by the purchaser is to ensure their conformity to the specification whereas inspection by the manufacturer during production is to ensure uniformity and reduce quality fluctuations to the minimum. For process control, the manufacturer shall take representative samples of the product at regular intervals to control the quality fluctuations. For fuel filters, the inspection levels given below are recommended for routine control over the manufacturing process:

Characteristics/Tests	*Frequency of Inspection/Tests*
a) Visual Characteristics:	
1) For fuel filters (such as direction of flow, crack, etc)	All
2) For filter inserts	All
b) Dimensional characteristics:	
1) For fuel filters (such as mounting dimensions, mounting hole, diameter, etc)	All
2) For filter inserts:	
i) For critical dimensions	All
ii) For others	20 percent
c) Mechanical tightness	All
d) Through flow quantity, pressure drop	Two filters for every week's production
e) Filtering efficiency and clogging test	Two filters for every week's production. The filters which are subjected to through flow quantity and pressure drop tests may be used for these two tests also.

A-1.2 For effective process control, the use of statistical quality control techniques is recommended and helpful guidance may be obtained in this respect from IS : 397 (Part 2)-1985 'Method for statistical quality control during production: Part 2 Control charts for attributes and count of defects (*second revision*)'.

A-1.3 The inspection data or the results of tests done at the place of manufacture may be made available with the material supplied to enable the purchaser to judge the acceptability of the lot.

A-1.4 When such information cannot be made available to the purchaser or when the purchaser so desires, the procedure laid down in **A-2** shall be followed for judging the conformity of the lot of fuel filters to the requirements of this specification.

A-2. Scale of Sampling

A-2.1 *Lot* — In any consignment, all the fuel filters manufactured under similar processes of production shall constitute a lot.

A-2.2 Fuel filters shall be selected and examined for each lot separately for ascertaining their conformity to the requirement of the specification.

A-2.3 The number of fuel filters to be selected from a lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 1. All these fuel filters shall be taken at random from the lot.

A-2.4 In order to ensure the randomness of selection, a random number table as agreed to between the purchaser and the supplier shall be followed. In case such a table is not available, the following procedure is recommended for use:

> Starting from any fuel filter in a lot, count them in one order as 1, 2, 3, ... up to r, and so on, where r is the integral part of N/n (N being the lot size and n the sample size indicated in col 2 of Table 1). Every rth fuel filter thus counted shall be selected to constitute a sample.

TABLE 1 SCALE OF SAMPLING AND PERMISSIBLE NUMBER OF DEFECTIVES

(*Clauses* A-2.3, A-2.4, A-3.1, A-3.2 *and* A-3.3)

Lot Size *N* (1)	Sample Size for Dimensions *n* (2)	Permissible Number of Defectives (3)	Sub-Sample for Mechanical Tightness (4)	Sub-Sample for Other Tests (5)
Up to 50	5	0	2	1
51 to 100	8	0	3	1
101 to 300	13	0	4	2
301 to 500	20	0	6	2
501 to 1 000	32	1	8	3
1 001 and above	50	1	10	3

A-3. Number of Tests and Criteria for Conformity

A-3.1 *Dimensions* — All the fuel filters selected according to **A-2.3** and **A-2.4** shall be first examined for dimensions (*see* **3**). Any fuel filter failing to meet one or more of the requirements of dimensional characteristics shall be considered as defective. If the number of defective fuel filters found in the sample is less than or equal to the corresponding permissible number of defective given in col 3 of Table 1, then the lot shall be declared as conforming to the requirements of dimensional characteristics.

A-3.2 *Mechanical Tightness* — The lot which has been found satisfactory in respect of dimensional characteristics shall be examined for mechanical tightness (*see* **5.1**). For this purpose, a number of fuel filters equivalent to the sample size indicated in col 4 of Table 1 shall be chosen at random from those already selected according to **A-2.3**. If no defectives are found,the lot shall be considered to have met the requirement of mechanical tightness.

A-3.3 *Other Tests* — The lot which has been found satisfactory in respect of dimensional characteristics and mechanical tightness shall be first examined for through flow filtering efficiency (*see* **5.4**) and clogging test (*see* **5.5**). For this purpose, a number of fuel filters equivalent to the sample size indicated in col 5 of Table 1 shall be chosen at random from those already selected according to **A-3.2**. The lot shall be declared as conforming to the specification if each fuel filter passes these tests satisfactorily.

EXPLANATORY NOTE

This Indian Standard is being brought out due to the changing demands of the industry. It has to be referred to in association with the Indian Standard Specification already published for the two-stage, one litre capacity fuel filters (IS : 3169-1965 Specification for two stage, one litre fuel filters for diesel engines).

This Indian Standard is to be read in conjunction with IS : 3351-1968. A separate Indian Standard Specification for fuel filters of 0.2 litre capacity (IS : 12500-1988 Specification for 0.2 litre diesel fuel filters) has also been published.

This standard essentially covers those types of filters mounted for gravity feeding, between fuel tank and injection pump and between feed pump and injection pump in case of fore feeding.

A separate standard for filter inserts is also under preparation.

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